CLAIMS

What is claimed is:

1. An apparatus for enabling communications between a computer and a battery-powered device, each having an interface for sending and receiving respective data signals and for providing a respective power signal, the electrical operating ranges of the computer-provided and battery-powered device-provided power signals being dissimilar, the apparatus comprising:

a microcomputer module comprising an interface for exchanging data signals with the computer and for receiving the power signal from the computer, a microcomputer for controlling the exchange of data via the module interface, and a memory element for storing microcomputer operating instructions and data processed thereby, the microcomputer operating in the electrical operating range of the computer and selectively reformatting data in accordance with the formatting requirements of the computer and the battery-powered device, respectively; and

a bridging module in communication with the microcomputer of the microcomputer module and the battery-powered device and adapted to compensate for the dissimilar electrical operating ranges of data exchanged between the computer and the battery-powered device via the bridging module,

whereby data transmitted by the computer via the computer interface is received at the microcomputer via the module interface, selectively reformatted by the microcomputer, and transmitted to the battery-powered device via the bridging element, and

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

whereby data transmitted by the battery-powered device is received at the microcomputer module via the bridging element, selectively reformatted by the microcomputer, transmitted to the computer by the module interface, and received by the computer via the computer interface.

2. The apparatus of claim 1, wherein the bridging module is operative to modify at least a portion of the exchanged data into a form compatible with the electrical operating range associated with the computer or battery-powered device receiving the exchanged data.

3. The apparatus of claim 2 wherein the bridging module comprises a level shifting circuit to alter the amplitude of at least a portion of the exchanged data into a form compatible with the electrical operating range associated with the computer or battery-powered device receiving the exchanged data.

4. The apparatus of claim 3, wherein the level shifting circuit comprises:

a direct electrical connection for conveying data from the battery-powered device to the microcomputer module; and

an electrical connection including a level shifting circuit to reduce the amplitude of the data conveyed from the microcomputer module to the battery-powered device.

5. The apparatus of claim 4 wherein the level shifting circuit is a voltage divider circuit.

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

6. The apparatus of claim 2 wherein the bridging module comprises a wireless communications link between the microcomputer module and the battery-powered device.

7. The apparatus of claim 6 wherein the wireless communications link comprises an optical transmitter and receiver in communication with each of the microcomputer module and the battery-powered device.

8. The apparatus of claim 6 wherein the wireless communications link comprises an RF transmitter and RF receiver in communication with each of the microcomputer module and the battery-powered device.

9. The apparatus of claim 2 wherein the bridging module comprises a fiber-coupled optical communications link.

10. The apparatus of claim 1 wherein the computer interface is a USB interface and the module interface is a USB-compliant interface.

11. The apparatus of claim 1, wherein the microcomputer is operative to store data in the memory element prior to transmitting it to the computer or the battery-powered device.

12. The apparatus of claim 1, wherein the microcomputer is operative to transmit data to the computer and the battery-powered device at dissimilar rates.

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

13. The apparatus of claim 1, wherein the microcomputer is operative to transmit data to the battery-powered device at a rate slower than that at which the microcomputer transmits data to the computer.

14. The apparatus of claim 13 wherein a data signal for data transfers from the second system to the first system is encoded using a ¼, ¾ with a nominal 4-microsecond bit cell and a data signal for data transfers from the first system to the second system is encoded using a 4/14, 10/14 with a nominal 14-microsecond bit cell.

15. The apparatus of claim 1 wherein the data transmitted by the microcomputer to the battery-powered device via the bridging module is encoded using Manchester encoding.

16. The apparatus of claim 1, wherein the battery-powered device, bridging module and microcomputer module are disposed in a common enclosure.

17. The apparatus of claim 1, wherein the bridging module and the microcomputer module are disposed in a first enclosure selectively coupleable to the computer and to the battery-powered device.

18. The apparatus of claim 1, wherein a first portion of the bridging module is physically housed with the battery-powered device and a second portion of the bridging module is physically housed with the microcomputer module, the first and second portions of the bridging module being selectively

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

coupleable and the computer interface and the module interface being selectively coupleable.

19. The apparatus of claim 1, wherein the microcomputer module further comprises a power supply for enabling microcomputer operation independent of the computer-provided power signal.

20. A system for enabling communications between a port of a computer and a low-power device, the computer and the battery-power device having dissimilar electrical operating ranges, the system comprising:

a bus module having

a module port compatible with the computer port and selectively coupleable therewith,

a microcomputer in communication with the module port and operative to exchange data with the computer via the module and computer ports,

a memory in communication with the microcomputer for enabling the selective storage of data by the microcomputer and for storing instructions executable by the microcomputer; and

a bridging module having a first end in communication with the microcomputer and a second end in communication with the low-power device, the bridging module for enabling the exchange of data between the microcomputer and the low-power device despite the dissimilar respective electrical operating ranges.

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

21. The system of claim 20, wherein the microcomputer is operable to selectively reformat data exchanged between the computer and the low-power device.

22. The system of claim 20, wherein the bridging module selectively modifies the electrical levels of the data exchanged thereby.

23. The system of claim 22, wherein the bridging module alters the voltage levels of data transmitted to the low-power device.

24. The system of claim 20, wherein the first and second ends of the bridging module are optically coupled.

25. The system of claim 20, wherein the first and second ends of the bridging module are wirelessly coupled.

26. The system of claim 20, wherein the low-power device, the bridging module, and the bus module are disposed within a common physical enclosure.

27. The system of claim 20, wherein a first portion of the bridging module is commonly housed with the low-power device and a second portion of the bridging module is commonly housed with the bus module.

28. The system of claim 27, wherein the first and second portions of the bridging module are selectively coupleable and the bus module and the computer are selectively coupleable.

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313

29. The system of claim 20, wherein the bus module further comprises a power supply for microcomputer operation independent of a power signal provided by the computer port.

ATTORNEY DOCKET NO. ONSET-018XX
WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313